REMARKS

This is in response to the Office Action mailed August 24, 2006.

The preamble of claims 1-22 have been amended for clarification purposes to recite "a computer-based method" instead of "a method". No new matter was added via this amendment.

This amendment should obviate outstanding issues and make the pending claims allowable. Reconsideration of this application is respectfully requested in view of this response/amendment.

STATUS OF CLAIMS

Claims 1-25 are pending.

Claim 23 is cancelled via the current amendment.

Claims 1 and 23 stand objected to because of minor informalities.

Claims 1, 6, 13-14, 16, 19, and 25 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention.

Claims 1-23 stand rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-7, and 9-25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 6,957,236 (Ganesh) in view of U.S. 6,516,320 (Odem).

Claim 8 stands rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. 6,957,236 (Ganesh) in view of U.S. 6,516,320 (Odom) and further in view of U.S. 6,584,459 (Chang).

OVERVIEW OF CLAIMED INVENTION

The present invention provides for a method for transient versioning in a storage architecture that manages ***node ranges***, wherein the method comprises of: (a) receiving a ***node modification request*** (e.g., a node deletion request, a node insertion request, a node modification request, etc.) from a database system; (b) ***copying a node range*** where the node modification request is to be made to a transient storage; (c) ***labeling the copied node range with an identifier*** (e.g., timestamp or LSN); and wherein said labeled node range is locatable via said identifier and a hash on said node range.

The present invention also provides for a method for transient versioning in a storage architecture that manages ***node ranges*** via a ***node id range index***, wherein each node is assigned a node id value and a set of nodes form a node range. Each entry in the node id range index points to a node range and its range identifier, RID. The method comprises the steps of: (a) receiving a ***node modification request*** for a range; (b) ***shadowing nodes in said range*** to a Version Hash Table based on RID; (c) assigning a time identifier (e.g., timestamp or LSN) to copies of said range; wherein a node in said shadowed range is locatable via said time identifier and RIDs.

New readers, after a modification, access current nodes through a new RID and old readers access old nodes via the same RID, with the shadowed copy being locatable in said Version Hash Table by hashing the same RID.

In one embodiment, when modifications cause nodes in a range to be moved to a new RID, previous readers are redirected from the new RID to the old RID via a Redirection Hash Table. In another embodiment, when modifications cause nodes in a range to be moved to a new

RID, previous readers are redirected from the new RID to the old RID via an index that describes where old versions are in said Version Hash Table. In another embodiment, for range deletions, the range being deleted is moved to reserved RID RIDFF.

The present invention also provides computer medium carrying computer readable program code implementing the above-mentioned methods.

CLAIM OBJECTIONS

Claims 1 and 23 are objected to due to minor informalities.

Claim 23 is cancelled via the current amendment.

On page 2 of the Office Action mailed August 24, 2006, the Examiner objects to claim 1's use of the phrases "local area network" and "wide area network." However, it appears that there is a typographical error with respect to this objection as Applicants respectfully note that these phrases do not occur in claim 1 but, instead, occur in claims 6 and 17. The minor informalities identified by the Examiner have been corrected in claim 6 and 17 without adding new matter. Specifically, the phrase "local area network" has been corrected to read "a local area network" and the phrase "wide area network" has been corrected to read "a wide area network".

REJECTIONS UNDER 35 U.S.C. § 112

Claims 1, 6, 13-14, 16, 19, and 25 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention.

Minor amendments have been made to claims 1, 6, 13-14, 16, 19 and 25 to correct informalities and antecedent basis issues without adding new matter. Applicants respectfully request the Examiner to remove the §112 rejection with respect to elaims 1, 6, 13-14, 16, 19, and 25.

REJECTIONS UNDER 35 U.S.C. § 101

Claims 1-23 are rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter. The rejection with respect to claim 23 is moot in light of its cancellation via the current amendment.

The preambles of claims 1-22 have been amended for clarification purposes to recite "a computer-based method" instead of "a method". No new matter was added via this amendment.

Further, Applicants agree with the Examiner's statement that pending claims 1-22 are "useful and concrete", however, Applicants respectfully disagree with the Examiner that "no results are written to non-volatile media, or, for example reported to a user". Specifically, the Examiner is respectfully reminded that pending claims 1-22 are all directed to ***computer-based methods*** and the Examiner is further respectfully requested to review the independent claims, for example independent claim 1, which specifically references the step of "***copying, to a storage***, a node range to which said node modification request is to be made" (emphasis added). Similarly, independent claim 9 teaches the step of "***shadowing*** nodes in said range to a Version Hash Table based on RID" (emphasis added).

Hence, Applicants respectfully request the Examiner to withdraw the 35 U.S.C. §101 rejection.

REJECTIONS UNDER 35 U.S.C. § 103

Claims 1-7 and 9-25 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,957,236 (hereafter "Ganesh") in view of U.S. Patent No. 6,516,320 (hereafter "Odem"). Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ganesh in view of Odom and further in view of U.S. Patent No. 6,584,459 (hereafter "Chang"). To be properly rejected under 35 U.S.C. § 103(a), the cited references have to provide for each and every element of the rejected claims. Applicants respectfully submit that the combination of the Ganesh and Odem and the combination of Ganesh, Odem, and Chang fail to teach or suggest many of the features of the rejected claims.

Ganesh teaches a computer-implemented method for providing a data item to a transaction, wherein the method comprises the steps of: (a) locating, within volatile memory, a first version of a data block that includes a first version of the data item; (b) determining whether the first version of the data item is usable by the transaction without respect to whether the first version of the data block is useable by the transaction; (c) if the first version of the data item is usable by the transaction, then establishing said data item as a candidate that can be provided to the transaction; and (d) if the first version of the data item is not useable by the transaction, then obtaining a version of the data item that is usable by the transaction from a second version of the data block that is different from said first version.

Odom teaches tiered hashing for data access wherein a memory for access by a program being executed includes a data access structure stored in memory, the data access structure including a first and second index structure together forming a tiered index. According to Odom, at least one entry in the first structure indicates an entry in the second structure.

With respect to pending claim 1's feature of "receiving a node modification request from a database system", the Examiner cites column 8, lines 26-30 of the Ganesh reference as teaching such a feature. Column 8, lines 26-30 of the Ganesh reference are reproduced below:

> "If the transaction that holds the lock is not active, then control passes to step 210 to determine the commit time of the transaction that held the lock (which is the latest transaction to modify the version of the row that is in that version of the data block)."

It is clearly evident from the above-citation that the Ganesh reference is merely addressing a lock contention scenario; more specifically, a situation when a transaction that holds a lock is not active. Ganesh addresses such a situation by identifying the commit time of such a transaction that is no longer active. Conspicuously absent in the above citation is a teaching or suggestion for ***node ranges*** or a teaching or suggestion for receiving a ***node modification request*** from a database system. Applicants are unsure how the Examiner is equating Ganesh's step of identifying the commit time of a transaction that is no longer active to Applicants' step of receiving a node modification request from a database system. Applicants, therefore, respectfully contend that the Ganesh reference fails to teach or suggest claim 1's features as asserted by the Examiner.

With respect to pending claim 1's feature of "copying, to a storage, a node range to which said modification is to be made", the Examiner cites column 4, lines 61-65 of the Ganesh reference as teaching such a feature. Column 4, lines 61-65 of the Ganesh reference are reproduced below:

> "For example, suppose a first transaction causes a copy of a data block to be loaded into a volatile memory, updates the copy of the data block to create a new version (the 'first version') of the data block, and then commits at time T10."

It is once again clearly evident from the above-citation that the Ganesh reference is merely addressing a lock contention scenario; more specifically, a situation wherein updates are made to a copy of a data block to create a new version. Conspicuously absent in the above citation is a teaching or suggestion for ***node ranges*** or a teaching or suggestion for ***copying, to a storage, a node range*** to which said node modification request is to be made. Applicants are unsure how the Examiner is equating Ganesh's step of creating a version of a data block in memory to Applicants' step of copying, to a storage, a node range to which said node modification request is to be made. Applicants, therefore, respectfully contend that the Ganesh reference fails to teach or suggest claim 1's features as asserted by the Examiner.

With respect to pending claim 1's feature of "labeling said copied node range with an identifier", the Examiner cites column 4, lines 41-54 of the Ganesh reference as teaching such a feature. Column 4, lines 41-54 of the Ganesh merely addresses a multi-versioning system wherein time parameters such as INCLUDE TIME (specifying the commit time of the most recently committed transaction whose changes are included in the version of the data block) and EXCLUDE TIME (specifying the time at which the contents of the data block were "current") are maintained. Conspicuously absent in the above citation is a teaching or suggestion for ***node ranges*** or a teaching or suggestion for labeling a ***copied node range*** with an identifier. Applicants are unsure how the Examiner is equating Ganesh's time parameters such as INCLUDE TIME and EXCLUDE TIME to Applieants' step of labeling a copied node range with

an identifier. Applicants, therefore, respectfully contend that the Ganesh reference fails to teach or suggest claim 1's features as asserted by the Examiner.

Applicants agree with the Examiner's statement that the Ganesh reference "does not explicitly indicate 'and a hash on said node range'". However, Applicants respectfully disagree with the Examiner's assertion that such a feature is remedied by the Odom reference. Specifically, the Examiner cites column 4, lines 45-64 of the Odom reference as teaching such a feature. Column 4, lines 45-65 merely teach fixed and dynamic hash structures. Conspicuously absent in the citation is a teaching or suggestion for how a ***labeled node range*** is locatable via an ***identifier and a hash*** on the node range. Applicants, therefore, respectfully contend that the Ganesh and Odom references fail to teach or suggest claim 1's features as asserted by the Examiner.

With respect to pending claim 9's feature of "receiving a node modification request for a range", the Examiner cites column 8, lines 26-30 of the Ganesh reference as teaching such a feature. As mentioned earlier, column 8, lines 26-30 of the Ganesh merely addresses a lock contention scenario wherein a transaction that holds a lock is not active. Ganesh addresses such a situation by identifying the commit time of such a transaction that is no longer active. Conspicuously absent in the above citation is a teaching or suggestion for ***node ranges*** or a teaching or suggestion for receiving a ***node modification request*** from a database system. Applicants, therefore, respectfully contend that the Ganesh reference fails to teach or suggest claim 9's features as asserted by the Examiner.

With respect to pending claim 9's feature of "shadowing nodes in said range to a Version Hash Table based on RID", the Examiner cites column 4, lines 61-65 of the Ganesh reference as teaching such a feature. As mentioned earlier, this citation merely describes a situation wherein

updates are made to a copy of a data block to create a new version. Conspicuously absent in the above citation is a teaching or suggestion for ***node ranges*** or a teaching or suggestion for ***shadowing nodes*** in said range to a ***Version Hash Table based on RID***. Applicants maintain that there is neither an explicit nor an implicit mention in Ganesh for shadowing nodes or shadowing nodes in a node range to a table based on RID. Applieants, therefore, respectfully contend that the Ganesh reference fails to teach or suggest claim 9's features as asserted by the Examiner.

With respect to pending claim 9's feature of "assigning a time identifier to copies of said range; wherein a node in said shadowed range is locatable via said time identifier and RIDs", the Examiner cites column 4, lines 41-54 of the Ganesh reference as teaching such a feature. As mentioned earlier, Column 4, lines 41-54 of the Ganesh merely addresses time parameters such as INCLUDE TIME and EXCLUDE TIME and **CANNOT** be equated to Applicants' step of assigning a time identifier to copies of said range; wherein a node in said shadowed range is locatable via said time identifier and RIDs. Applicants, therefore, respectfully contend that the Ganesh reference fails to teach or suggest claim 9's features as asserted by the Examiner.

Furthermore, as mentioned earlier, Odom merely teaches fixed and dynamic hash structures. Conspicuously absent in Odom is a teaching or suggestion for how a ***shadowed range*** is locatable via a ***time identifier and RIDs***. Applicants, therefore, respectfully contend that the Ganesh and Odom references fail to teach or suggest claim 9's features as asserted by the Examiner.

Hence, Applicants respectfully request the Examiner to withdraw the rejections with respect to independent claims 1 and 9, and hereby respectfully request allowance thereof. Further, the above-presented arguments for independent claims 1 and 9 substantially apply for

independent claims 24 and 25 and dependent claims 2-8 and 10-22. Hence, Applicants respectfully request the Examiner to withdraw the rejections with respect to claims 2-8, 10-22, 24, and 25, and hereby respectfully request allowance thereof.

If the Examiner still feels that Ganesh and Odom deal with node range versioning or if the Examiner still feels that Ganesh and Odom teach specific recitations of Applicants' pending claims, Applicants' wish to emphasize that it is the duty of the Examiner to specifically point out limitations with respect to each and every claim element such that Applicants' are aware of how the Examiner is applying a reference in a rejection. Specifically, §1.104(c)(2) of Title 37 of the Code of Federal Regulations and section 707 of the M.P.E.P. explicitly states that "the particular part relied on must be designated" and "the pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified".

SUMMARY

As has been detailed above, none of the references, cited or applied, provide for the specific claimed details of Applicants' presently claimed invention, nor renders them obvious. It is believed that this case is in condition for allowance and reconsideration thereof and early issuance is respectfully requested.

As this response has been timely filed, no request for extension of time or associated fee is required. However, the Commissioner is hereby authorized to charge any deficiencies in the fees provided to Deposit Account No. 09-0460.

If it is felt that an interview would expedite prosecution of this application, please do not hesitate to contact Applicants' representative at the below number.

Respectfully submitted,

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